

## REMARKS

As a preliminary matter, Applicants' representative thanks the Examiner for removing the noted objections/rejections under paragraphs 4-10 of the Office Action.

This communication accompanies a Request for Continued Examination. Claims 1-20 are pending in this application. Claims 1, 17 and 19 have been amended to more clearly define the invention. Support for these claim amendments may be found in paragraph 0060 of the application as originally filed. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented on pages 3-6, with an appropriate, defined status identifier, for the convenience of the Examiner. No new matter has been added by way of amendment.

Applicants respectfully request reconsideration of the present application in view of the reasons that follow.

### **I. Claim Rejections Maintained**

Claims 1, 8, 9, 11, 12, 16 and 20 stand provisionally rejected under the doctrine of judicially created obviousness-type double patenting over claims 1, 8-10, and 14 of copending Application No. 10/934,023. As of October 13, 2006, U.S.S.N. 10/934,023 was still pending, and thus the rejection of claims 1, 8, 9, 11, 12, 16 and 20 remains provisional.

Applicants respectfully submit that the procedure set forth in § 804(I)(B)(2) of the M.P.E.P. is applicable to the present provisional double-patenting rejection. Section 804(I)(B)(2) of the M.P.E.P. requires that

[i]f a 'provisional' statutory double patenting rejection is the only rejection remaining in one of the applications (but not both), the examiner should withdraw the rejection in that application and permit the application to issue as a patent, thereby converting the 'provisional' double patenting rejection in the other application into a double patenting rejection when the application issues as a patent.

Because Applicants believe that, after consideration of the following remarks, no other rejections shall remain in the present application, Applicants respectfully request that

Examiner Tran withdraw the provisional double patenting rejection of claims 1, 8, 9, 11, 12, 16 and 20 in the present application, based on claims 1, 8-10, and 14 of copending Application No. 10/934,023, and allow this application to issue. Applicants make no admission regarding the propriety of the double patenting rejection in this application over U.S.S.N. 10/934,023 and specifically reserve the right to challenge the propriety of this rejection.

## **II. Claim Rejections Under 35 U.S.C. § 103.**

### *A. Abbott II and Anawis*

Claims 1-3, 6-14, and 16-20 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 6,284,197 issued to Abbott *et al.* (hereinafter ‘Abbott II’) in view of Anawis *et al.* (U.S. Patent No. 5,091,318, herein ‘Anawis’). Applicants note that to provide continuity with Applicants’ prior response filed on 2/6/2006, Abbott II is used to describe U.S. Patent No. 6,284,197, despite ‘Abbott I’ not being used in this response. In the rejection, the Examiner alleges that the claim limitation of the surface of the biochemical blocking layer is a rubbed surface,” is a process limitation...[and that] these limitations do not differentiate the claimed apparatus from the apparatus of Abbott et al.” (Office Action pages 9-10.) Applicants respectfully traverse this rejection for the reasons that follow.

#### 1. The rubbed biochemical blocking layer surface of claim 1 provides distinctive characteristics not found in prior art devices.

As stated in M.P.E.P. § 2113, “[t]he structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or *where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product.*” (Citing *In re Garnero* 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979), emphasis added.)

Applicants assert that the process limitation that the “biochemical blocking layer is a rubbed surface” provides distinctive characteristics that are not found in the device of Abbott II. More specifically, as recited in claim 1, the process of rubbing the surface of the biochemical blocking layer imparts the structural characteristic that the surface drives a uniform alignment of

liquid crystals. Applicants request that the Examiner give full consideration to all of the elements of claim 1, including the element that “the biochemical layer is a rubbed surface.”

In support of the assertion, Applicants hereby introduce a declaration under 37 C.F.R. § 1.131, signed by Nicholas L. Abbott (herein ‘The Abbott Declaration’), stating that he is an inventor of the present application (U.S.S.N. 10/625,869), and Abbott II. The Abbott Declaration refers to Exhibit A in which the structural characteristics of a rubbed biochemical blocking layer surface, as exhibited by liquid crystal alignment, are illustrated.

Applicants direct the Examiner’s attention to FIG. 3 of Exhibit A. Panel (A) of FIG. 3 is a photograph showing the optical texture of a glass substrate with a film of bovine serum albumin (BSA) as a blocking layer with a liquid crystal (5CB) disposed thereon. The blocking layer in Panel (A) has not been rubbed. As is readily observed, the surface of the liquid crystals is irregular and non-uniform in appearance. Conversely, Panel (B) of FIG. 3 is a photograph showing the optical texture of a glass substrate with a film of BSA, that has been *rubbed after deposition* of the BSA, with a liquid crystal (5CB) disposed thereon. As is readily observed, the surface of the liquid crystals appears black and featureless indicating that the liquid crystals are aligned by the rubbed biochemical blocking layer. Panels (C) and (D) are the same *rubbed* substrate as shown in panel (B), but taken at different angles between substrate and polarized light (C) or with other optics in the optical path (D). Both panels (C) and (D) also show uniform, featureless surfaces of the substrate, after rubbing of the biochemical blocking layer.

As can be readily observed, the process limitation of rubbing of the biochemical blocking layer imparts distinctive structural characteristics to the substrate that would otherwise not be obtained with the device or teachings of Abbott II.

2. *A rubbed biochemical blocking layer surface is not taught or suggested by the cited references.*

Applicants assert that the process limitation that “the biochemical blocking layer is a rubbed surface,” is an element that is not taught or suggested by Abbott II and/or Anawis, and therefore, a *prima facie* case of obviousness has not been established.

As recited in § 2143 of the M.P.E.P, regarding the requirements for a showing of obviousness under 35 U.S.C. § 103:

[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The Examiner admits that Abbott II does not include biochemicals, and turns to Anawis to cure this deficiency. (Final Office Action page 12.) However, in view of their remarks of record regarding Abbott II and Anawis and now in further view of the Abbott Declaration, Applicants reiterate that Abbott II fails to teach or suggest that the “biochemical blocking layer is a rubbed surface,” and Anawis fails to cure the deficiency.

The Examiner has not pointed to or shown any prior art teaching that suggests providing a rubbed biochemical blocking layer that drives a uniform alignment of liquid crystals.

(a) Abbott Fails to Teach a Rubbed Biochemical Blocking Layer

In discussing the rejection, the Examiner states that “Abbott et al. disclose[s] that liquid crystals are ‘extraordinarily sensitive to external perturbations’...such that whether the surface of the substrate is rubbed before or after the ‘anchoring’ of the liquid crystal would result in the same effect, i.e. ‘drive a uniform anchoring of liquid crystals.’” (Final Office Action, page 8.) Applicants direct the Examiner’s attention to the full quotation from Abbott II:

As a result, liquid crystals display an extraordinary sensitivity to external perturbations (e.g., temperature, pressure, electric and magnetic fields, shearing stress or foreign vapors). Abbott II, col 1, lines 44-46.

All of the exemplified perturbations are related to externally applied phenomena – none of which is related to whether or not a biochemical blocking layer has a rubbed surface imparting distinctive characteristics to the device. That temperature, pressure, electric and magnetic fields, shearing stress, or foreign vapors may be used to alter alignment of a liquid crystal is immaterial

to the discussion of whether or not a biochemical blocking layer may be rubbed to impart distinctive characteristics not known prior to the present application.

The Examiner's above assertion suggests that it is rubbing before or after *liquid crystal deposition* that makes the difference. The Examiner has misconstrued Abbott II's relation to the present disclosure. It is rubbing prior to or after deposition of the *biochemical layer* that makes the difference.

Again, Applicants direct the Examiner's attention to the Abbott Declaration. FIG. 5 of Exhibit A shows the structural differences between a surface that is rubbed prior to the deposition of a BSA biochemical blocking layer and a surface that is rubbed after the deposition of a BSA blocking layer. Panels A and C of Figure 5 illustrate the uniform and featureless surface of a liquid crystal on a rubbed substrate (glass and PTFE, respectively). Panels B and D are panels A and C, respectively, *after* deposition of the biochemical blocking layer showing a non-uniform alignment of the liquid crystal on the non-rubbed blocking layer. Thus, the deposition of a biochemical blocking layer *onto* a rubbed surface erases any effects that the rubbing of the substrate *prior* to biochemical blocking layer deposition would impart, while rubbing of a biochemical blocking layer *after* deposition, as recited in claim 1, imparts distinctive characteristics not otherwise shown by prior art devices. Furthermore, Figure 5 demonstrates that the exposure of a rubbed surface without a biochemical blocking layer to non-specific binding proteins in solution results in the non-specific binding of proteins to the surface, which masks the structural features imparted to the rubbed surface by the rubbing.

As a complement to the results shown in FIG. 5, FIG. 6 of Exhibit A also shows that the effects of rubbing a BSA biochemical blocking layer (Panel A) are *not* impacted by nonspecific binding agents (Panels B, C, E, and F), while specific binding agents such as anti-BSA IgG disrupt the anchoring of the liquid crystals. In other words, FIG. 6 shows that the effects of rubbing of a biochemical blocking layer are preserved in the presence of non-specific binding agents, but are changed as a result of specific binding agents.

In conclusion, the Abbott Declaration and above remarks show that rubbing of a biochemical blocking layer after deposition on a substrate to produce a "biochemical blocking layer [that] is a rubbed surface" is not the same as, and is readily distinguishable from, an

unrubbed biochemical blocking layer on either a rubbed or unrubbed substrate. Applicants submit that in view of the Abbott Declaration and above remarks, Abbott II simply cannot be found to meet all the structural and process limitations of the claimed apparatus.

(b) Anawis Also Fails to Teach a Rubbed Biochemical Blocking Layer

The Examiner states that “Abbott et al. [i.e. Abbott II] differs from the presently claimed invention by failing to disclose that the biochemical blocking layer comprises biochemical such as blocking agent of bovine or equine serum albumin.” (Final Office Action page 10.) Instead the Examiner relies upon Anawis to teach a blocking agent such as bovine or equine serum albumin. (Final Office Action, page 10.) However, Applicants submit that Anawis fails to teach or suggest that the “biochemical blocking layer is a rubbed surface,” and thus fails to fill the voids of Abbott II.

As stated above, Applicants stand by their remarks of record (see response filed 2/6/2006) concerning the use of Anawis to fill the voids of Abbott II. In summary, Anawis discloses a device for detecting the presence of an analyte (antibody) in a test sample. However, Anawis does not disclose a biochemical blocking layer that is rubbed, as recited in claim 1 of the presently claimed invention. As discussed above, this is a limitation that must be considered in assessing the patentability of this claim. Therefore, the combination of Abbott II and Anawis cannot be found to obviate the present invention.

In view of the above remarks and the Abbott Declaration, Applicants submit that Abbott II and Anawis, alone or in combination fail to teach or suggest each and every element of claim 1. The Abbott Declaration definitively shows that the device of current claim 1 provides distinctive characteristics not found in the devices of Abbott II. As such, Applicants respectfully submit that a *prima facie* case of obviousness has not been established and request that the Examiner reconsider and remove the noted rejections.

*B. Abbott II, Anawis, and Weetall.*

Claims 5 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Abbott II, in view of Anawis, and further in view of Weetall *et al.* (Applied Biochemistry

and Biotechnology 1993, 41, pp. 157-188, herein 'Weetall.') Applicants respectfully traverse this rejection.

Applicants now have shown that neither Abbott II nor Anawis teach or suggest a biochemical blocking layer having a rubbed surface that drives a uniform alignment of liquid crystals, as recited in amended claim 1, from which claims 5 and 15 depend. Weetall fails to cure this deficiency. Therefore, Applicants respectfully submit that this rejection has been overcome and respectfully request that it be withdrawn.

### CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date October 20, 2006

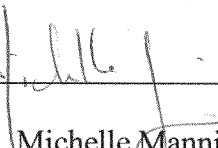
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